devoteam

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How **Artificial Intelligence** is revolutionizing the Retail Industry ?

Creative tech for Better Change

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FOREWORD

This white paper is aimed at an audience of retail professionals with no in-depth technical expertise and it has two objectives. By pooling the views of Devoteam's retail specialists and those of players from companies in the sector, the document shows all that AI can bring to retail companies today and in the next years. In light of the major processes that shape business, this first part identifies the major challenges currently facing the retail sector and the solutions that AI can provide, with examples of some of the precursors to support.

In the second part, Devoteam experts and our partner Google detail the main areas of work that need to be initiated in order to bring its data and AI approach to fruition. As we shall see, the technological aspect must not overshadow the importance of the human and organisational facets of this major transformation for the retail sector.

I would particularly like to thank the various contributors for their kind cooperation on this document. They have infused it with the irreplaceable wealth of their experience.

Benoît Fremaux
VP Retail & CPG
Devoteam

INTRODUCTION

Thanks to the power of the cloud, artificial intelligence (AI) has entered its maturity phase, and is already beginning to revolutionise many business sectors. Between 2010 and 2020, the volume of data produced annually increased 25-fold and this trend is expected to continue unabated over the next 10 to 20 years. With storage and processing capacities following the same exponential curve, we can truly say that, in this first half of the 21st century, we are entering the data age. Far from being unaffected by this revolution, the retail sector could be one of its main protagonists and beneficiaries.

As part of their processes, retailers generate large amounts of data that they have been using for many years, to optimise their supply chain, for example. Added to this, is a second type of data: the data generated by customers throughout their shopping experience, whether online or in-store. These data, which can increasingly be collected and used, shed additional light on the business. They make it possible to go further in optimisation and to cover new processes, such as the customisation of the product offering. Finally, data provided by third parties, such as the weather forecast, and road traffic or people's daily movement routines, introduce additional dimensions that further strengthen analysis, optimisation and decision-making.

Today, the power of AI makes it possible to harness these three data sources combined to achieve unprecedented levels of optimisation and reinvent almost all retail processes: customer experience, marketing, product offering and purchasing, supply chain, support and back office functions, among others.

Therefore, in an extremely competitive sector, in which the Covid-19 crisis is amplifying and accelerating deep-rooted and sometimes painful changes, and where profitability is a question of survival, AI emerges as a strategically important lever. This is why the investments in AI must be seen in the light of its benefits in terms of customer experience and operational excellence, and why AI-related projects must be launched without delay, while taking all the necessary precautions and the control measures to monitor and achieve the desired benefits.

We hope you enjoy reading it!

Aymen Chakhari
Group Global Head of AI & Big Data Director
Founder of the Data Intelligence Academy[1]
Devoteam

[1] The «Data Intelligence Academy» is an academy founded by Devoteam to help its clients adapt to AI- and data-related topics according to business, strategic and technological challenges.

HOW AI CHALLENGES VARIOUS ASPECTS OF RETAIL

In 2020, the retail sector is at a crossroad. From the omnipresence of digital technology to salient environmental concerns, societal changes are transforming consumer behaviour and shattering traditional models. The sudden and unexpected Covid-19 crisis has only amplified these trends and made the need for brands to reinvent themselves even more urgently. In all areas of their activity, from the customer experience to the creation of the product offering, from marketing to the supply chain, retailers are facing issues of vital importance. To respond to these issues, they have at their disposal a tool of unprecedented power that has now reached maturity: artificial intelligence.

1. THE CUSTOMER EXPERIENCE

Increasingly informed, autonomous and demanding, consumers are no longer satisfied with being guided in how they shop. According to their desires and needs, they navigate between physical and digital channels and expect the same and the best experience in terms of product offering, services and use. This is a challenge that AI can help brands rise to.

Among the many changes underway in the retail sector, that of the customer experience is undoubtedly one of the most spectacular and far-reaching. In just a few years, we have shifted from linear, prescribed experiences to blended experiences. The latter combine the physical and the digital, and are created by customers themselves during their purchasing process. For the brand, optimising these multi-channel routes, over which it no longer has complete control, is a major challenge. In fact, it has to anticipate allocating its products and resources in order to meet increasingly high expectations at every stage. These expectations are often driven by the standards of experience provided by purely digital operators. Ultimately, the aim is to improve customer satisfaction, measured using the Net Customer's Score (NPS).

One of the customer's overriding requirements is to personalise their experience as they go along. They expect:

- products and services tailored to their purchasing habits and needs
- convenient access to products, both at the physical point of sale (external and internal accessibility, organisation of the sales area, merchandising, signposting, etc.) and on digital channels (presentation of the product offering, search engine, clarity of merchandising, etc.)
- an experience adapted to their geographical location and pace of life, taking into account their practical constraints (opening hours, delivery times, etc.)
- a fluid and integrated process, anticipating, if possible, the next steps when they are part of their habits (or what they consider to be self-evident)
- prices commensurate with their purchasing power and attractive promotional offers, particularly through combined purchasing offers
- benefits linked to their loyalty programme, which should enable them to be known and recognised by the brand and its employees, and to benefit from discounts and services rewarding their frequent visits

Monitoring the conversion rate per product, from the moment the customer arrives in the sales area or on the website, is one of the means of adjusting all parameters, thereby optimising turnover, margin and NPS.

However, one of the major difficulties for retailers is that all the components of the experience, which seem so straightforward to coordinate for the customer, have historically come from very different functions, professions, technologies and investments. Bringing consistency to the customer experience, optimising it and customising it therefore requires prior internal decompartmentalisation and a collective alignment with this common objective. Sometimes it is the whole organisation - and its culture - that has to undergo a revolution in order to become customer-focused.

AI FOR THE CUSTOMER EXPERIENCE

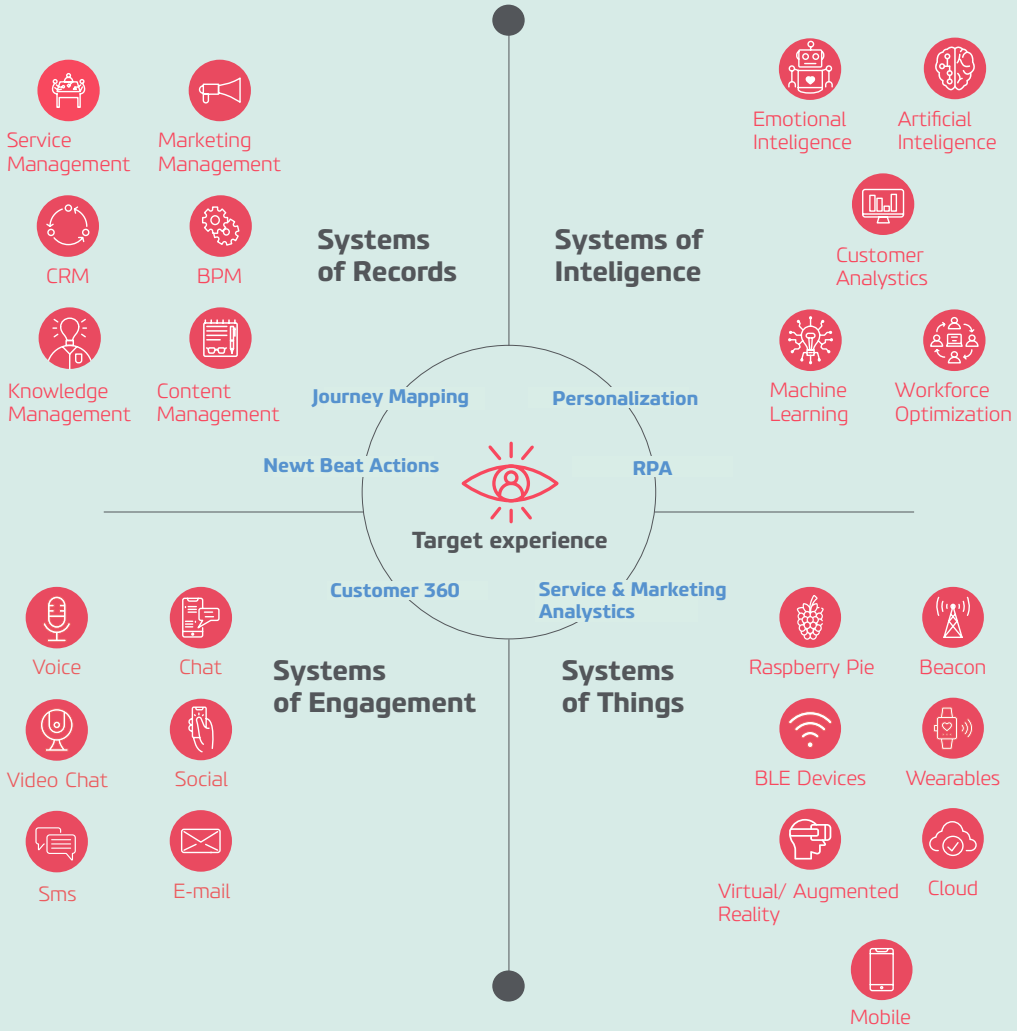
Customising experiences, anticipating stages and resources, combined optimisation of different types of parameters... We can see that AI has a key role to play in providing customers with the most enjoyable, efficient and satisfying experience possible throughout their purchasing journey. Here are some of the applications already in use:

Self-adapting homepage: By recognising the visitor, based on their profile, purchase history and previous browsing experience, digital portals can customise the customer experience by creating highly relevant displays at every stage of the interaction. The richer and more numerous these interactions are, the more accurate a picture of the user the AI can paint, and the more the customisation improves with each visit.

Visual curation: Thanks to machine learning algorithms, it is possible to transpose browsing behaviours into the real world. Automatic image processing makes it possible to base recommendations on aesthetic similarity, and thus to offer customers products that match their tastes or what they are searching for.

Customised shop front: Intelligent retail spaces recognise the customers who are in the store and tailor the display of products, prices and services to match their profile or loyalty status or the promotions for which they qualify, creating a large-scale, customised experience for everyone.

AI TO SYNCHRONISE SYSTEMS AROUND THE CUSTOMER



source : Devoteam

A PERSPECTIVE FROM... FABRICE BESCHU

Fabrice Beschu
Director of Operations
Decathlon Group

At Decathlon, we have noticed three key expectations from our customers: a broad product offering in line with the brand's promise; a highly personalised service around the product, with a strong emphasis on its use; and a fair and dynamic price, something which remains an essential factor even though it is increasingly being weighed against other considerations, particularly environmental ones.

Traditionally, in the field of sports, the product is displayed, tried out on the spot and bought immediately. Nowadays, however, many people do research on the web before going to the shop, and it is important to ensure there is continuity between the physical and digital dimensions of the experience, to the point of accompanying their visit to the shop on their mobile phone, for example. This is why we will have to offer diverse options in the future: for example, reserving certain items via the digital channel, or displaying certain products and allowing them to be tried out, but having them delivered rather than having them in stock. It is not always necessary to have all items on site as long as they are available online. We tested a shop near Lille which pushed the concept to the extreme by allowing items in certain categories to be tested only; it became apparent that customers really wanted to leave with their purchase in hand.

To keep pace with these developments, data will continue to grow in importance at all levels. In relation to price, data must enable us to position ourselves as accurately and dynamically as possible, in keeping with our promise to provide the best value for money on the market.

The stakes are high: sometimes, adding one euro more to the price has only a marginal influence on sales, but when it comes to a product that sells 3 million units it means an increase of 3 million Euro in turnover! As far as merchandising is concerned, data will help department managers to optimise the choices that they currently make somewhat blindly, for example: by helping them to better understand what is actually happening in their catchment area in terms of sporting activities.

As far as the product offering is concerned, we need to offer the widest possible range because in every sport we connect for all levels, from beginners to experts. And we are dealing with different people every time, with different expectations in terms of customer and user experience. For example, we sell excellent, value-for-money neoprene wetsuits, but the page featuring them on our site is far less frequently visited than similar pages on specialised sites. This is not an SEO problem, but a problem of experience in the broadest sense: we need to display our products where our customers are so that their experience can begin. This is a major challenge for us.

Data should also help us in the design/procurement cycle. Decathlon is currently able to design products 18 months ahead of time before ordering its stocks 6 months ahead of time and then having almost no adjustments to make. To significantly reduce these lead times, we will probably have to switch to on-demand production based on the latest available data. This will probably involve starting with a « digital first » product, which will make it possible to gauge the market's response, to acquire some insights and an initial set of data. Subsequently, this will make it possible, at a second stage, to move on to mass production and distribution.

In conclusion, AI will be everywhere because data is everywhere. AI will help us to harness our experience, make efficiency gains and cope with the changes we need to make in our business, provided we can spend more time analysing the data than producing it. To achieve this, we are deploying our data strategy along three lines: the data model, which will aim for excellence on 500 key data items; the customer experience, which should enable us to verify the relevance of the data; and the rolling out of a number of major flagship projects capable of changing the way data is perceived throughout the company.

2. MARKETING

As the art of availing of customer and market knowledge, marketing has been one of the first areas to benefit from digital. This has enabled data to be considerably enhanced. It has also been one of the first areas in which AI has been applied, which allows it to harness AI.

In business, knowing your customers well so that you can offer them the right product, in the right place, at the right time and at the right price has always been the key to success. For a long time, loyalty cards were practically the only way to collect information about customers in shops (when they had one), but in just a few years, digital has changed everything.

On the one hand, digital technology makes it possible to collect more data via websites and mobile applications, which require contact details (address, e-mail, telephone number, etc.) and which often invite you to add valuable personal information (age, sex, preferences, etc.) to your profile, and enable the collection of behavioural data (browsing journey, place and time of connection, etc.). On the other hand, recent technological developments allow the large-scale storage of this data, processing of the data to make them usable (consistency, duplicate management, etc.), their analysis using increasingly sophisticated algorithms and the recovery of the results in a user friendly and convenient form. However, these considerable opportunities are being increasingly tightly regulated, particularly since the introduction of the GDPR in 2018.

This knowledge of individuals facilitates good knowledge of your market, i.e. for each product category, your customers, its purchasing behaviour and the positioning of the competition. Cross-referencing market data and customer behaviour can be used to monitor attrition from an omni-channel perspective. This is one of the key issues in retail because the most loyal customers also yield the most profits. Detecting « lapsed » customers by analysing their purchase history and the changes in their behaviour (frequency of visits, average basket amount, etc.) enables the company to retain its best customers through targeted operations.

Similarly, the quality of commercial targeting, whether it be via physical channels (e.g. leaflet distribution) or digital channels (e-mailing, retargeting, etc.), remains particularly important for increasing turnover and customer satisfaction. In this way, customer segmentation by behavioural and profile affinity increases the effectiveness of promotional campaigns. Combined with product / price / geographical targeting, it significantly increases customer satisfaction by making it possible to put together a product offering that is as close as possible to their expectations, thereby increasing turnover and margin.

AI FOR MARKETING

AI represents a genuine revolution for marketing, especially in retail, and has already led to major advances in two key areas.

First, with regard to customer knowledge, AI has made it possible to go beyond the traditional approaches of Business Intelligence (BI) and Business Monitoring. Thanks to Machine Learning, in particular, it is possible to extract individual characteristics from masses of multi-structured and multi-dimensional data that enable us to understand customers, to quantify and qualify their behaviour, preferences, habits, etc., and therefore to anticipate their expectations. This type of approach is used in many areas:

- allocation of sales
- reduced attrition
- improved cross-selling and bundling of services
- increase in customer satisfaction
- improved customer acquisition
- fewer lapsed customers and targeted win-back

The second priority area of AI application in marketing is the automation of campaigns and decision support. AI facilitates the building of monitoring and learning systems capable of evaluating campaign performance and identifying key trends. This allows campaign spending, testing and decisions to be optimised thanks to the recommendations generated by machine learning. Some of the most frequent areas of use include:

- optimising pricing strategy: Machine Learning enables dynamic, real-time price optimisation and targeted advertising
- optimising advertising messages: Machine Learning models such as Random Forest make it possible to select the most relevant advertisement and address it to the right customer at the right time. What happens next, new suggestions, for example, is tailored to how the customer has responded
- Click & Engagement: using neural networks, AI facilitates the tracking of consumer clicks and browsing journeys by progressively optimising recommendation systems to improve both the customer experience and the value of the basket

CONVERGING VIEWS

Michael Rolland
Chief Marketing Officer
Devoteam Group

Benoist Bazzara
President
Devoteam Customer Effectiveness

Can it be said that the marketing function in Retail will improve thanks to AI?

M.R: For marketing, AI's main contribution lies in the subtlety of knowing your customer and being able to analyse behaviour in real time. These are two crucial elements because they make it possible to keep up with the pace set by customers. On the Internet, the time spent on a website is becoming increasingly shorter, so the customer must be offered information that is both extremely accessible and extremely relevant within that period of time.

B.B: To achieve this level of accuracy, a lot of data needs to be collected. That's the heart of the matter. Large retailers have the capacity to generate large volumes of data, and AI gives them the analytical power to make the data talk. AI provides unique insights into customer behaviour and helps to define priority targets. The more marketers can tune in to these people, the more they are able to differentiate their campaigns by segment or break down to the individual level. AI therefore enables marketing and sales strategies to be aligned in a «customer-centric» approach, and to increase overall performance.

To what extent will AI transform the interaction between brands and customers?

B.B: The customisation offered by AI is gradually finding its way into interactions between brands and consumers. For example, AI makes it possible to implement bots capable of responding to a customer at any time and to provide him or her with tailored and effective assistance in real time.

M.R: In my opinion, what will revolutionise the customer experience is image recognition. Within five years, it will be a reflex and it will be used for everything. With AI, a single photo will be enough to find out everything about a product, including where to buy it. Speech recognition has also recently made a very promising breakthrough with the rise of virtual assistants. These assistants will continue to improve in order to be able to answer increasingly complex questions. Above all, the retail sector must not ignore these new AI-based channels as they will considerably influence customers' knowledge of products and their uses.

Do marketing professionals now trust AI's predictions?

B.B: These days, a large number of start-ups are offering high-performance and accessible predictive analysis solutions. Retail operators need these tools to segment their campaigns, even if on a small scale. Retailers of all sizes have an increasing presence on social media, which are highly effective channels for reaching customers. Targeted advertising is the norm on social media and retailers have to be able to do it.

M.R: Despite the need for it, predictive analysis is still barely used. Only a few major players such as Walmart[2] actually use AI in this area. Most analyses are still based on traditional algorithms and models. As for the start-ups, they certainly are developing interesting technologies, but they do not have the necessary scale to support the big players in the retail sector. In my opinion, the future of predictive analytics will involve the major cloud platforms.

[2] How Walmart Is Using Machine Learning AI, IoT And Big Data To Boost Retail Performance (https://bernardmarr.com/default.asp?contentID=1181)

What is the level of maturity of marketing automation?

M.R: In B2C, marketing automation works very well, maybe even too well! It is so well-established that it no longer comes up with any surprises for the customer. In B2B, on the other hand, there are still steps that have to be taken. We are seeing more and more interesting areas of usage and lead generators. But what role does AI play in this? A very small one for the moment.

B.B: In B2B, AI can help you make the right decisions and save time, but it will not replace the business relationship. AI will support sales teams.

A PERSPECTIVE FROM...

Sylvain Luce
Head of the Datascience & Customer Knowledge division
Picard

Marie-Sophie Blond
CRM BI & Data Manager, IT Department
Picard

Russell Kouadio
Data & CRM Manager, IT Department
Picard

“At Picard, we have been carefully analysing our customer data for ten years in order to get to know the customers better so that we can sell better. We have seen that this approach is effective. Our customer knowledge is 90 % omnichannel because we consolidate our home delivery and in-store sales activities around a common identifier; e-mail.

At first, we used customer knowledge for profiling and digital customisation. Recently, we launched an initiative to enable the product teams to make use of this information as well. With 85% of our items being own-label, we see great potential for optimising our product focus. Ultimately, we want data and customer knowledge to cascade into many other company departments: procurement, logistics, and even HR. For example, we could assess the « churn[3] » of our employees just like we do for our customers in order to identify the talent that is likely to leave us. For this type of application to become widespread, we must first acculturate the whole company to data, so that everyone can identify the value it could bring. This is a process that will take several years.

[3] Churn is a term that refers to the loss of customers or subscribers.

As far as AI is concerned, we already have five areas of « customer-centric » use in production:

- **Customer segmentation**: This is the first application we have implemented, and we have seen excellent results. Thanks to a classification algorithm, we have highlighted five categories of extremely consistent behaviours, which gives us a very relevant strategic and operational segmentation. We ascertained, for example, that just one of these categories accounted for the purchase of 70% of our best-seller, green beans in 1.5 kg bags.

- **Churn**: analysing purchasing behaviour alerts us to when a customer is likely to leave the brand within 90 days, enabling us to retain him.

- **Susceptibility to promotion**: which enables us to assess the attractiveness of our operations to customers, and therefore to manage them more effectively.

- **The recommendation engine**: on average, our customers buy 46 items out of a range of 1,200. By drawing on purchase history and customer knowledge, this tool will help us to push products that customers do not buy but that they might like. Our aim is for this engine to work in real time and for it to be closely integrated with digital channels.

- **Regional sensitivity to the weather**: the weather influences purchases everywhere, but not in the same way depending on whether you are in Luxemburg or Paris. Being aware of this cross-influence allows each shop to better anticipate its sales based on weather forecasts.

At this stage, these areas of use do not require real time. For the moment we are one day behind the data, mainly for technical reasons. We know, however, that real time will soon be required, especially on digital channels. For example, our in-store promotion engine allows us to trigger benefits, but only real time will allow us to move towards greater customisation. One of the means to do this will be to regroup our data in a single data lake over which we will have full control, even if it will be hosted in the Azure cloud.

One of our projects for the second half of 2020 will be transactional NPS[4]. We believe that this will further improve our customer knowledge. In addition, we want to be vigilant about communication pressure on customers. With AI, we will be able to make the best decisions, whether it be for paper leaflets (now accurate to the nearest street) or digital communications.

[4] Net Promoter Score

3. PRODUCT OFFERING AND PURCHASES

Which products should be offered and at what price? A new twist has been given to this question, which is at the heart of the retailer's activity, with digital technology shattering the concepts of choice, competition, availability and promotion. AI is becoming the essential tool for managing an increasingly complex, dynamic and multi-faceted product offering.

For retailers, building a range of products and services consistent with the brand's strategy and aligned with customers expectations in each catchment area is a major challenge as well as a tricky exercise. How broad should the product offering be, i.e. what is the range of needs they are intended to meet? How deep should the product offering be, i.e. how many products will they offer for each of these needs? And finally, what should be the price point of these different products?

With the rise of digital technology, these questions become even more critical. Strategies can be differentiated according to channels, for example, with equivalent breadth in physical and online shops, but a much greater depth in digital.

The price point must also be worked on very precisely at different levels:

- at the level of the point-of-sale itself, particularly through the most sought-after products, which determine customers' opinion of the prices charged by the brand
- within each product category, with a certain uniformity between products with comparable price points (e.g. premium, national brand, own brand, entry-level, etc.)
- between categories where cross-purchasing is common or encouraged

Finally, this pricing strategy must be applied consistently across the different channels, with customers being able to make comparisons (and not be deprived of this!) at all times.

Very popular with customers and retailers alike, dynamic pricing makes it possible to adapt to market conditions as closely as possible (demand, stocks, competition, etc.) and to increase the number of one-off operations (happy hours, for example). However, it is still difficult to implement in physical stores, where prices are still mostly displayed on paper labels.

Promotional operations, in particular large seasonal operations and sales, are a special case because pricing is linked to the major issues of traffic generation and inventory adjustment. Controlling the process from start to finish, from commitments to monitoring disposal rates, is therefore a key element in the management of the retail activity.

Finally, the sale price is closely linked to the purchase price, and those involved in the purchasing function must have data and tools enabled at their disposal to optimise negotiations with suppliers. In particular, they must be able to use background elements and historical sales data that enable them to anticipate volumes.

AI FOR PRODUCT OFFERING AND PURCHASES

Machine learning is unquestionably one of the most promising tools for aligning product offerings and prices with customer expectations. For example, Walmart uses symbolic AI algorithms (based on a body of knowledge and not a mass of examples) to provide decision-makers with information enabling them to choose the needs they wish to meet, and then « bandit algorithms « (strategy optimisation in a probabilistic environment) to identify, for each of them, the best products.

Through its ability to explore historical data in a combinatorial way, AI also makes it possible to make the link between the physical and digital channels, and to ensure they are consistent.

Finally, machine learning is already widely used in the field of dynamic pricing, both at the physical point-of-sale and on the web. Many retailers use convolutional neural networks to push the best price to close the sale based on the time, the item and the customer. A four-dimensional matrix (consumer, time, products and price profiles) is explored every day to find this optimal combination.

A PERSPECTIVE FROM... FRANCK DARTOIS

Franck Dartois
Chief Information Officer
IDKIDS

IDKids is a group of retailers specialising in the children's market, comprising brands such as Okaidi (textiles, historical brand), Oxybul (games), Jacadi, and others; and also services: crèches (Rigolo comme la Vie), a magazine (Bubble Mag), experiences (N'Joy), etc. In 2020, the retail sector has to reinvent itself: it has to provide more value for the customer. Customers are no longer happy to simply consume the products that retailers make available to them.

The first issue is Corporate Social Responsibility (CSR). As textiles and toys are sensitive products with regard to children and the textile industry is one of the most polluting (because of cotton), health, safety and, more generally, the CSR dimension are of paramount importance. However, there is no link with AI... for the moment ... but we are setting up a CSR index equivalent to the Nutri-score for food.

The second issue is changing the relationship with the customer, to make it much more personalised. The decision-makers when it comes to making purchases are mainly parents, but also children from a certain age upwards and the family (grandparents). A customer is therefore multi-faceted and is often distinct from the user of the product. Our ambition is to 'capture' our users as early as possible, ideally before birth. With this in mind, we have launched ConsoBaby, which is the 'Trip Advisor' for babies and which is consulted by 9 out of 10 pregnant women. This confirms that digital and eCommerce are no longer options, but a must-have.

The third issue is therefore that of the omnichannel approach, which is rather effective at IDKids on the operational side (purchases, stocks, delivery, ship from shop, click & collect, making in-store appointments). As far as data is concerned, we see 3 areas of action: Marketing, Product Offering and Supply chain.

The most advanced is digital marketing and the technology provides the ability to process complex requests in record time. AI automates humanprocesses... but humans will remain central. We use commercial Data Management Platforms (DMPs) that are fed by internal data (customer records etc.) and online and offline events (visits, tickets, etc.). We have created use cases: a product recommendation engine (corresponding to preferences and expectations), performance of sales operations, management of lapsed customers, etc. As the frequency of purchases is relatively low (1 to 2 times a year on average), our challenge is to increase the frequency. We measure the performance of business operations relatively accurately and have found, for example, that the SMS channel works less well and that social media are becoming the most effective channels.

It is also important to analyse changes in behaviour. For example, sales no longer work 'as they used to': it is essential to know the customers in order to better target them with promotional offers that are relevant to them. On the other hand, we tried to discontinue the Christmas toy catalogue and had to backtrack because that remains something our customers expect to see.

We also aim to converge customer data between relatively watertight brands and independent marketing systems.

With regard to the Product Offering and Supply Chain areas, this is the beginning of the adventure. For example, we are trying to compare the conventional methods of detecting fashion trends (travel, etc.) with what we can learn from social media. But this is still done only to low levels.

To sum up, the question is not whether to do it: it is a question of 'faith' and we must do it. The businesses at IDKids are open intellectually ... but have not yet acquired the expertise or practical experience. The setting up of a Data-Lake of high-quality data is a must, and is already operational. However, data quality is a real challenge and the importance of data owners should not be underestimated: it is a role, not a function... Finally, it is important to take into account the management of change in the professions (IT, Management Board, Supply Chain, etc.) because data acculturation is key. External support is preferable for getting started, but internal oversight remains essential.

4. SUPPLY CHAIN

Covering all upstream and downstream flows, the Supply Chain forms a dynamic system of extreme complexity. However, the profitability of retailers and the satisfaction of their customers depend to a large extent on its optimisation. In this environment, where data is plentiful, AI appears to be an essential tool.

In retail, mastering the Supply Chain depends largely on the quality of sales forecasts. Ideally, the level of accuracy should be product per shop (or e-commerce website) and per day (or even per hour). This in-depth knowledge makes it possible to optimise orders to suppliers so as to benefit from the best pricing (taking into account all the cost and discount elements identified and provided by purchasing), optimise the supply chain and stocks, and reduce the risks of breakdowns at the point-of-sale or on digital channels. The challenge is not only to have precise and reliable figures, but also to have them early enough to be able to take the best possible action.

Forecasting sales is especially tricky because it depends on the type of items involved. The models used in clothing, toys or fresh produce, are extremely different from one another. There will also be specific rationales according to whether the products have a high turnover, « long tail « type products, which are bought by few customers but must be on the shelf, or scarce products, where demand is - temporarily or structurally - greater than supply.

In addition to traffic projections and conversion rates (in-store and on digital channels), sales histories are used and an effort is made to take account of as many influencing factors as possible, both long-term (seasonal events, consumer trends, etc.) and short-term (e.g. weather). The challenge is to identify these factors, to assess their individual and combined weights and, above all, to determine and then capture the data to quantify them.

Once procurement has been completed, stock management is another major Supply Chain issue. In order to minimise, on the one hand, the cost of fixed assets and, on the other hand, the cost of stock shortages, products must be distributed as well as possible between central warehouses, local warehouses and shop reserves. Then, sales must be monitored in real time in order to be able to dynamically adjust these different stock levels while taking into account logistical and restocking constraints. This is a delicate balancing act that can make all the difference in a sector where margins are low and customers are volatile.

Finally, for larger organisations, the management of warehouses, whether automated or not, can also offer very significant profit potential. The same applies to the management of the various stages of transport; from the supplier to the warehouse, from the warehouse to the shop and, for certain activities, that last mile of delivery to the end customer, or even the return of products that the end customer does not wish to keep.

One of the challenges of the Supply Chain is to successfully coordinate these numerous improvements in order to achieve an overall optimum rather than a sum of compartmentalised optimisations that could excessively weaken one of the links.

AI FOR THE SUPPLY CHAIN

The Supply Chain is one of the areas in which AI can be used the most. The optimisation of models using Machine Learning (ML) and Natural Language Processing (NLP) enables unprecedented operational efficiency.

Supply Chain specific ML applications include combining Reinforcement Learning algorithms and Convolutional Neural Networks (CNNs) to predict, among other things, demand levels, product routes, staffing requirements, promotions to be considered and the likelihood of their success, possibilities for combined packaging of orders, and the collection of till data for customised predictive analytic input.

One of the most common problems in the distribution sector is route optimisation. Classical mathematical techniques such as Markov chains or operational research have long been used to try to solve it. However, AI and its continuous learning approaches through events and optimisation iterations yield results that are far superior to those obtained by these traditional methods. With AI, each optimised route is stored to allow the learning algorithm to continuously improve its suggestions. Tesco and Alibaba, for example, use such approaches. Walmart combines ML and NLP to classify customer-supplied addresses to solve the puzzle of unstructured addresses.

AI has also proved its effectiveness in managing drivers' schedules (scheduling), managing the logistics network and in all kinds of operational issues. For example, Tesco deploys a routing algorithm that optimises the comings and goings of picking staff in the online order shop. This solution, based on decision trees, has reduced walking time by 20%.

Image recognition based on AI and Deep Learning is another area that holds promise for the Supply Chain, for example for addressing the thorny issue of fresh produce spoilage and waste in food retail. Based on several parameters such as product shape and temperature, Walmart's EDEN solution is able to evaluate the quality and freshness of products. This information makes it possible to dynamically optimise logistics flows and to prioritise dispatch to the nearest shops of the products that need to be consumed soonest. Since its trial run, EDEN has saved Walmart $93 million and the company estimates that it will bring in $2 billion over five years.

A PERSPECTIVE FROM... ALEXANDRE BRAUNER

Alexandre Brauner
Chief Information Officer
FM Logistic

FM Logistic is a group of 27,500 employees, with a presence in fifteen countries, where they support retail and consumer goods companies in managing their supply chains. We offer warehousing, parcel and retail order preparation and transport services, as well as product customisation and customised packaging operations, which we roll out according to demand. To do this, we handle pallets as well as individual packages and products in our warehouses and cross-docking sites. For transport, we use our own vehicles or on call partners. In addition, we offer sustainable urban logistics solutions that meet environmental expectations, for example with our Citylogin service.

Our businesses make us intermediaries between retailers and manufacturers. We manage a wide range of goods and information flows. We handle a lot of data: we process it and send it back to partners and clients, including private individuals, since we are active in B2B as well as in e-commerce logistics (the growth of which has further accelerated with the Covid-19 crisis). To achieve this, we are integrated upstream with manufacturers and downstream with clients. Every month, we exchange more than 4 million files via EDI[5] and, increasingly, via real-time APIs, especially for e-commerce. This requires an enormous amount of work to be done on data quality and security.

This data feeds, of course, into operational and management systems, but it also helps us to make the right decisions. We therefore replicate them entirely in the cloud, where we carry out a great deal of simplification, clean-up and dissemination work in order to make quality raw materials available to end users.

This context of plentiful data and complex operational issues is fertile ground for analytics in general and AI in particular. In practical terms, we use the data to optimise the location of products in the warehouses in order to reduce employee journeys, thus saving time and gaining efficiency. We can also inform our retail customers of their stock-keeping units (SKUs) that have not been picked for some time, enabling them to identify and optimise dormant stocks. Finally, a third use case concerns the economic optimisation of storage and delivery, with, for example, the allocation of stocks to the best-located warehouses or the implementation of «pooling», i.e. using one delivery vehicle to make deliveries for several manufacturers.

These applications do not yet use AI, but in the future it will play an essential role in all areas of the company by effectively supporting people doing repetitive activities, not by replacing people. In transport, for example, there are a lot of documents to manage, and AI's ability to read and interpret them already allows us to automate 80% of the processing in some of the countries in which we operate. AI also allows us to analyse the images from video cameras at the entrance to the warehouses to measure the length of the arriving trailers, in order to direct them in the best possible way and facilitate manoeuvring.

We are also thinking about combining AI with Robotic Process Automation (RPA). Eventually, Supply Chain flows will be orchestrated in a highly automated manner and people will deal with the exceptions.

Our goal is to always offer our customers the best possible services, and data and AI are already helping us to do this. We are at the beginning of a process and the possibilities are so vast that we need to identify the most relevant use cases for our customers. Beyond AI, we have also started to connect objects to explore the potential of the IoT. For example, we connect our forklifts and record their consumption, battery usage and distances travelled.

[5] Electronic Data Interchange

5. THE STORE'S BACK OFFICE FUNCTIONS

To support their core business activities, retailers must be able to rely on a number of cross-cutting functions and processes. Here we will focus on inventory operations, reducing shrinkage and managing operational resources, all of which can greatly benefit from AI.

Traditionally, stock is divided between warehouses, retail outlets and « rolling » stock, i.e. in transit in trucks. Depending on the product categories and the organisation method chosen by the retailer, in-store stock can represent a very significant proportion of the overall stock. Managing it is therefore crucial in order to avoid product shortages on the shelves (which lead to lost sales opportunities and disappointed customers), overstocking (which represents a significant cost), and to control shrinkage, known or unknown. The management and execution of inventory operations, possibly with the help of technologies such as RFID[7], provide more accurate information about actual stock levels. Being able to identify shortages is also essential, even if this happens once the problem arises. This nonetheless makes it possible to limit the impact of shortages, for example in the event of heavy traffic or poorly anticipated flows, by triggering restocking from the reserve or a nearby site as soon as possible.

Reducing shrinkage and fraud is also a major challenge for retailers. It is estimated that the value of unknown shrinkage (theft, losses, etc.) amounts to 50 billion Euro in Europe. Theft accounts for about 80 % of unknown shrinkage and is more or less equally divided between theft by customers and by staff. Detecting in-store theft and online fraud can significantly reduce these amounts and, for retailers, can yield a very high ROI[8].

At a time when the sector is questioning the model of very large stores, the careful management of operational resources (receiving, reserves, sales area and receipts) is a growing challenge. Customer satisfaction must be maximised, in particular by ensuring that the product offering is always on the shelves and that the wait at the checkout is reasonable. At the same time, the costs of mobilising unused resources must be managed (there is no point in having too many open checkouts without customers).

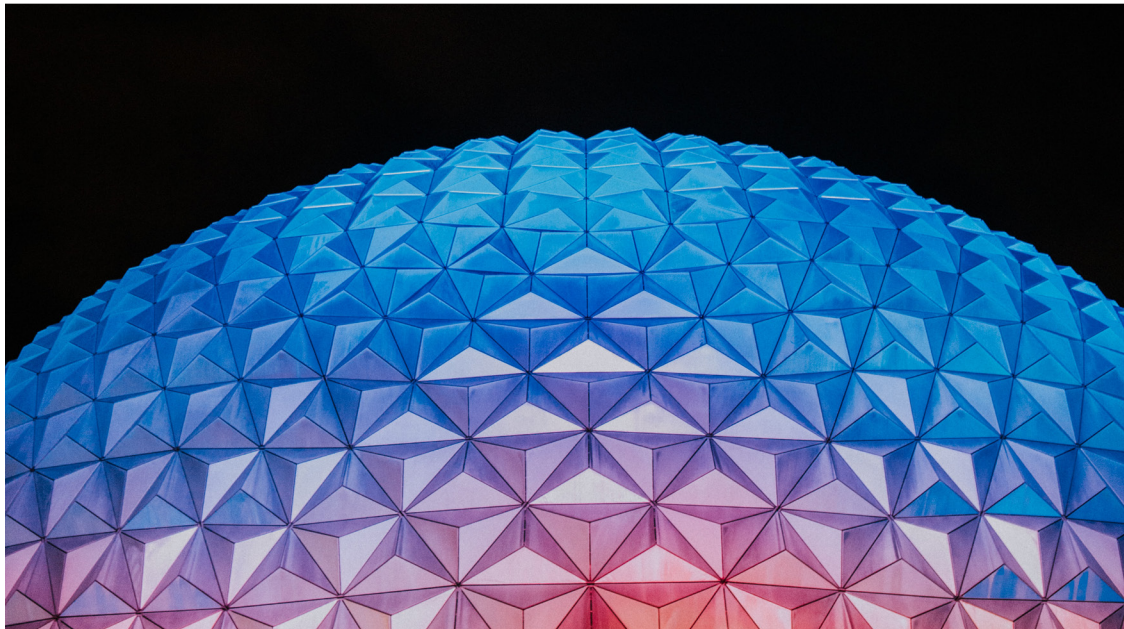
Of all these resources, human resources are unique because of their cost and the multiple associated requirements that need to be taken into account. For retailers, workforce and skills management remains an important parameter of their operational and economic performance.

[6] Radio Frequency Identification
[7] Retail Security in Europe 2019 Study | Ecommercemag.fr

AI FOR THE STORE'S BACK OFFICE

Thanks to its ability to cross-reference all kinds of data, including internal, such as sales history, and external, such as weather forecasts, AI is able to forecast demand with unprecedented accuracy and to automate restocking. It is estimated that unsold stock values 4 billion dollars, so it constitutes a considerable challenge for H&M. In order to personalise the stock in each physical store and adapt it to local demand, the Swedish group produced several Machine Learning models dealing with a set of data from various sources: purchases, returns, loyalty cards, search results, shop receipts, etc. This approach has made it possible to reduce overall stock-keeping units by 40% without compromising customer satisfaction.

Online fraud has not spared Retail. Thanks to unsupervised learning, AI is able to monitor events in real time and identify suspicious behaviour as well as possible loopholes exploited by fraudsters.



A PERSPECTIVE FROM... MICHEL MORVAN

Michel Morvan
Chief Information Officer
Picard

In the last ten years, Picard has featured in the top 5 favourite brands of the French people every time. Picard ranks first when the averages of these rankings are taken. We are loved for our products, 90% of which are own-brand, for the local presence of our points-of-sale and for the quality of our in-store teams.

Our customers have three main expectations: good products (healthy, organic and local); full traceability, for raw products such as green beans, our best-selling product, and for processed products alike; and a personalised relationship with our brand, regardless of the channel they use. Thanks to our loyalty card, from which around 70 % of our turnover is derived, we collect a lot of data on our customers' behaviour, both in our 1,000 shops and via our digital channels, even though these two worlds are still not sufficiently connected.

In the Supply Chain area, the main challenge in using this data is to simplify the management of orders going from the shop to the warehouse, as well as transfers between the shop stock and the sales area. These activities are currently manual in nature, time-consuming and carried out by small teams as each shop employs fewer than 4 FTEs on average. The time saved on these operations could be spent on the customer and on learning about the products.

We already have sales forecasting algorithms, but we want to go further with a Dataiku platform integrating external data which have a strong influence on our sales, such as the weather forecast. Paradoxically, with the exception of ice cream, we sell more products when it's cold!

We believe that AI will be able to provide us with more accurate models because it can handle larger volumes of data and is self-learning. Other areas of focus include the optimisation of our product ranges and the optimisation of our sales prices. On the other hand, the use of voice assistants is not one of our priorities, even though the technology is promising.

Technological aspects are certainly important, but the human issues must not be ignored. For example, we have to be paying close attention» to the impact that such solutions can have on the daily life of the teams in the shop. Similarly, we have chosen to rely on in-house expertise in these areas, in particular to guarantee the transparency of the algorithms we implement.

In an environment shaken by the Covid-19 crisis, which will push retailers to accelerate the transition from a multi-channel model to an omnichannel model, what we want is to have a centralised, controlled platform specific to Picard and which will be able to use our internal data and certain external data in real time so that we can increase the time we devote to our customers.

KEYS TO SUCCESS

As shown by the many use cases presented in the first part of this document, AI is now a mature and efficient response to the challenges of all kinds that retail operators face. Nevertheless, as the technology is still unfamiliar, a number of precautions are necessary to progress from potential to tangible success. Here are the key points identified by those who have already carried out such projects.

1. THE VISION: STRATEGY AND PRAGMATISM

By radically transforming some of the key processes in retail, AI will undoubtedly contribute to reshuffling the cards in the sector over the next few years. It is therefore vital that it be made a strategic priority and to give it the budget and attention that entails. Experience shows that retailers who have successfully scaled up their AI solutions are also those who prioritised it in their strategic focus. « It is important for the whole company - including management - to learn the language of analysis, data science and AI because it will change the way our entire organisation operates », stresses Léopold Sanogoh, Data Program Manager at Carrefour.

In particular, this data acculturation allows us to mature and to go beyond preconceived ideas, so that AI is no longer perceived as a magic wand or as a threat to HR. For example, H&M has more than 200 data scientists who adjust models every day according to customer behaviour and expectations. Their work does not replace the human element, but rather supports employees by providing them with richer and more accurate information on which to base their decisions.

However, this strategic approach must be applied pragmatically. Many retailers focus on very complex use cases and neglect others that are easier to implement. This excessively ambitious approach can be counter-productive as it over-complicates the standardisation of PoCs.

In retail, where gains are only worthwhile when they are multiplied by volume, the feasibility of scaling up is an essential factor to take into account.

As Benoist Bazzara, President of Devoteam Customer Effectiveness explains, « data scientists are often fond of the complex marketing solutions that AI can offer them but, initially, what I have seen succeed are simple and pragmatic projects. We agree on a basic MVP (Minimum Viable Product) and, once it has brought the expected profits, we can invest to deepen and enrich it. »

A good angle to pursue is to identify initiatives that will have good scalability is to adopt the user's point of view (customer or employee), and to give as much importance to the quality of the experience as to the implementation costs and the (theoretical) ROI of the solution.

Finally, this pragmatism is possible only if the company has a data department that is itself sufficiently mature in its tools and practices. Retailers who have already made the step to scale up have generally been able to rely on solid technical and methodological foundations.

> *« It is important for the whole company - including management - to learn the language of analysis, data science and AI because it will change the way our entire organisation operates » stresses Léopold Sanogoh, Data Program Manager at Carrefour.*

2. GOVERNANCE: DATA AND ETHICS

In data projects, good governance is often cited as a key success factor because it is the key to maintaining data quality over time. This is particularly true for AI because machine learning models are extremely sensitive to the accuracy of the data on which they are based, to the uniformity of the conditions in which they were collected, etc.

In order for these algorithms to reach their full potential, a good approach is to govern data by value and to develop quality « at source » by implementing a continuous improvement process. This Data Excellence approach requires a global vision of the data itself (nature, format, origin, etc.), their use (by which business, for which purposes, etc.) and the loss of value caused by quality defects. This makes it possible to identify the causes of poor quality, to set out the actions to be taken to remedy the poor quality and to prioritise the actions according to their impact on value.

This data governance must be complemented by governance of the AI itself and its use within the company. In addition to the continuous improvement of model results, the company must put in place the necessary bodies and safeguards to ensure compliance with requirements relating to transparency, applicability, safety, non-discrimination, etc. This ethical governance of AI is essential to building trust very early on, both internally and with clients.

3. SKILLS: A MULTI-LEVEL STRATEGY

When AI projects are expert-driven, it can be difficult to get buy-in to them. When they are business-driven, they are sometimes limited in scope and do not always take full advantage of the technology. In both scenarios, the setting-up of compartmentalised teams often results in duplication and/or incompatibilities.

The current trend is towards the formation of mixed teams, combining IT specialists and business know-how representing the various components of the company. To assist them, and to implement a clear and consistent AI strategy, it is strongly recommended that a cross-functional organisational structure be created. Setting up a centre of excellence (CoE) dedicated to AI often appears to be the best approach and this is the model we strongly recommend at Devoteam. Some retailers have also chosen to add AI responsibilities and skills to their existing Analytics or RPA teams (this is the case for Carrefour), or to pre-existing CoEs.

Wherever this cross-disciplinary AI structure is housed, its purpose is to support the businesses on the specific challenges of AI, such as prioritising use cases, raising awareness of accountability issues and the overall governance of AI. This structure should establish and oversee the overall AI strategy and data policies for the entire enterprise. It must also determine the AI technological and development standards for the enterprise (CRISP-AI by Devoteam[8]): AI architecture (different from data architecture), tools, algorithmic techniques and technologies, intellectual property, degree of autonomy of AI, interpretability, ethics, etc.

[8] CRISP-AI (Cross Industry Process for Artificial Intelligence) is an AI standardisation methodology that describes a set of processes to successfully standardise AI from production to monitoring.

However, AI competence cannot be confined to the centre of expertise. In the retail sector, the ubiquity of AI and its potential to change all aspects of the business will require the whole of the organisation's dynamic forces to acculturate to this new tool so that they can make good use of it.

Nevertheless, not everyone can become an expert and we can envisage a three-level skills strategy - AI Citizen Users, AI Citizen Scientists, Data Scientists - that will facilitate the dissemination of AI by setting up a collaborative effort.

Most of the company's employees will be trained at AI Citizen Users level. They will learn how to use the applications, comply with best practices and data governance rules, and call on specialists when needed.

At a more advanced level, AI Citizen Scientists provide the link between these business teams and the expert level. They are able to translate business needs in terms of AI, to develop simple models themselves using user-friendly tools such as AutoML, and to refer to the most complex problems to the last level, the Data Scientists of the CoE.

For these three groups to be fully operational, it will be necessary to watch out for the emergence of new professional skills and new roles. What tasks can be entrusted to AI Citizen Users? Which tasks require the skills of an AI Citizen Scientist? Which applications require an experienced Data Scientist? These are the questions that need to be asked constantly in order to adapt resources to a rapidly and constantly evolving field.

4. TECHNOLOGY: MORE MATURE, MORE AFFORDABLE

Four areas of AI technology can play a major role in retail:

- **Automatic signal processing:** These are technologies for capturing, reconstructing and identifying image, video and voice data. These include models for pattern recognition, image recognition, real-time video stream analysis, voice recognition, real-time 3D reconstruction. This technological area brings together machine-learning tools - including artificial neural networks: Convolutional Neural Networks (CNN), Recursive Neural Networks (RNN), Generative Adversarial Networks (GAN), etc. - as well as signal-based technologies such as the Kalman filter, which is widely used to reconstruct noisy or incomplete signals. For example, in the supply chain field, the digital twin uses these techniques to simulate, thanks to machine learning, the behaviour of sensors, to identify trends and to anticipate incidents.

- **Logic and reasoning technologies:** In the retail sector, this area of AI will concern everything that involves the optimisation of business processes. Business process management and monitoring will be carried out with machine learning, using AI to design new, more optimised processes, discover new sources of innovation, develop new service-oriented models, etc. Here, the most effective AI technologies are reinforcement learning models, which have the advantage that they base their behaviour on human logic, which facilitates their integration into operations.

- **Bots and cognitive interaction:** Retail is increasingly reliant on cognitive interaction, be it via bots (conversational agents) online or in-store, or in the implementation of cognitive experiences that allow for the identification of consumer interests, market trends, or even the analysis of emotions in order to personalise the in-store experience as much as possible.

- **Knowledge Management:** To take full advantage of the lessons learned from AI, these tools will make it possible to extract relevant knowledge for business uses (Knowledge Extraction), to build ontologies and to automate the processing of documentary assets.

In addition to these four key areas, there are also cross-cutting technological fields that can play a role, including automatic language processing (Natural Language Processing or NLP), deep learning and machine learning in general.

Nowadays these technologies are increasingly mature and affordable, whether in an open source ecosystem with a large number of libraries available to data scientists and engineers, or in a commercial cloud environment. The latter is moving more and more towards AutoML 2.0 platforms, which, following the implementation of machine learning, aim to automate data science itself in order to increase the productivity of data scientists who are increasingly in demand.

A PERSPECTIVE FROM... STÉPHANE SPINELLA

Stéphane Spinella
Director of Retail & CPG
Google Cloud

The great challenge for retailers today is to adapt to new consumer behaviour. Well-equipped, well-connected and accustomed to the standard of experience defined by the main shopping sites, they are more curious, more exacting and demand both very broad choice and instant services. There are of course differences according to product categories (food, home, cultural, etc.) as shown by the variability of online purchase rates (5% for Carrefour, 8% for Leclerc thanks to Drive, 25 % for Maisons du monde, etc.), but the increase is across-the-board and the Covid-19 crisis has only strengthened this trend.

Under the threefold pressure of consumers, competition and the economic context, all retailers today are wondering how to change more quickly. When you consider that Amazon's recommendation algorithms are the source of 35% of its turnover, and that these technologies are now very affordable, AI seems an obvious choice. We must not forget, however, that this is only a resource and that everything depends on the use we make of it. At Google Cloud, our mission is to expedite the transformation of companies by helping them better leverage their data, which is an invaluable asset for them. The data enables them to develop differentiated services, to increase their online turnover, to reinvent their operations by becoming « data driven «, and to reduce their costs and increase their profitability.

When you consider that Amazon's recommendation algorithms are the source of 35% of its turnover, and that these technologies are now very affordable, AI seems an obvious choice.

To achieve this, Google Cloud provides three ingredients: ready-to-use technological building blocks (recommendation, vision, natural language, etc.) via the Google Cloud Platform; expertise, particularly in terms of innovation; and business solutions. Our partnership with Carrefour implements these three dimensions with a particular focus on innovation and modernisation. The Carrefour/Google Cloud Lab develops business algorithms such as optimisation and product range recommendations for the Carrefour Market and City convenience stores, as well as for new ways to engage in voice purchasing. We are also working on AI Recommendation, a recommendation engine based on brand and customer data. La Redoute has used our technologies to offer product searches using visual recognition.

Clearly, the company's data remains its property and Google Cloud handles the processing in complete confidentiality, applying the highest level of security. With eight products, each with more than one billion users, this is an essential requirement. In addition, the external data (weather, traffic, images, etc.) used to train the models are not sold to companies, but published online. Finally, the ability to scale up is at the heart of the design of all our products, which meet the needs of having a local shop as well as a global brand.

Experience has enabled us to identify five key success factors for these projects: focus on the customer, to the point of obsession; promote the use of data and AI through the implementation of an adequate platform, organisation, skills and culture; equip the IT department and the business lines with digital skills beyond data; modernise the information system in parallel to make it more agile and data-oriented; and, finally, implement appropriate governance, with a strong and robust commitment at the highest level of the company.

5. DATA: THE ESSENTIAL FUEL

It seems obvious, but it is always a good idea to remember that without data, there is no AI. Implementing an adequate data acquisition strategy is one of the keys to the success of AI projects. Without high-quality data, AI will provide insufficient or even inaccurate results. This will disrupt operations and, as a result, undermine the credibility of the entire AI process and it will be hard then to regain the confidence of users. Therefore, data sources must be managed in order to guarantee their quality from the outset (format, frequency of collection, degree of accuracy, consistency, integrity, etc.), so as to avoid the tedious task of updating them when they are used.

Raw or pre-processed, structured or unstructured, data can come from a multitude of sources, especially in retail. In the first place, it is internal sources, i.e. all operational systems, at all levels of the value chain, that generate data: sales data, customer data, financial data, stock, supply chain, etc. However, retail is also highly dependent on external factors (events, weather, trends, etc.) that should be taken into account if at all possible. Unfortunately, these external data are often complex to acquire, of mediocre quality, and their weak - or even « black» - signals as they are known in machine learning jargon are difficult to interpret. However, despite this, they can still be used to enrich the parameters of machine learning algorithms and improve the accuracy of their analysis.

6. COMPLIANCE AND SECURITY: PROTECTING DATA AND MODELS

Because they collect and handle large volumes of sensitive data, the retail sector is particularly exposed to the risk of loss of control and cyber-attacks. In addition, security, compliance and privacy, relatively easy to capture on the restricted and/or closed boundaries of the POCs, constitute one of the trickiest points in the standardisation of AI models. Two major issues should therefore be taken into account: on the one hand, the evolution of threats and regulations, in particular concerning personal data (GDPR); and on the other hand, the need for business agility and fluidity, which requires pragmatic, ergonomic, economical and rapidly deployable security solutions.

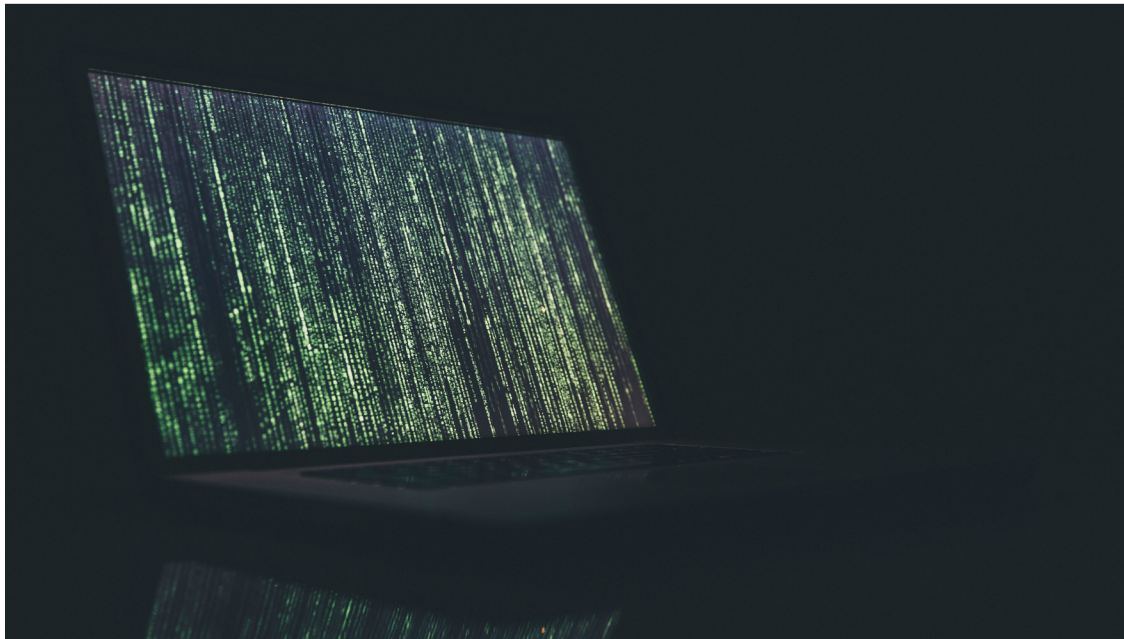
In order to find an acceptable balance between these often conflicting requirements, security must be built into projects from the outset with three priority areas of focus:

A. Securing data according to their criticality: To do this, it is necessary to draw up an information classification plan, provide tools for managing the metadata that reflect this classification, define the rules specific to each category and implement them.

B. Identity and access management tools: In open environments, security is first and foremost the responsibility of the user, and it is essential to limit access and actions to authorised persons only. SSO (Single Sign-On) tools allow for this granularity without detracting from the experience, but they also need to be supplemented with access control tools to secure entry/exit processes and to continuously adjust access, roles and responsibilities.

C. Systematising traceability and controlling data access: Data access traceability requirements must be built into the design of the information system from the outset, access control indicators must be put in place to enable adjustment decisions to be made, and data retrieval capabilities must be prepared for customers.

In addition, with the rise of AI, we are seeing the emergence of specific security needs to protect the models - a sensitive intangible asset that contain an increasing part of the know-how and specificity of the brand - and their results. In fact, as AIs are increasingly provided in the form of services via APIs and web services, there is a risk of attacks aimed at impairing their performance either by altering their parameters or by directly modifying the information they produce.



7. ACCULTURATION: TRUST FOR ALL

According to the IDC (International Data Corporation), the wave of AI will have reached all businesses by 2030[9]. In other words, in all companies, all employees, whatever their level or function, will potentially use AI-based systems, in one way or another. As with any tool, they will therefore need to be aware of its possibilities, limits and rules of proper use. For this reason, the IDC believes that acculturation must be one of the priority components of any AI strategy.

This acculturation must comprise three main areas of focus:

1. Strategic acculturation: At this level, the aim is to make decision-makers aware of the importance of setting up organisational and operational models that incorporate AI. This must be seen as a strategic imperative, the impact of which must therefore be taken into account at all stages of the project life cycle: data acquisition strategy, AI modelling strategy, model monitoring strategy, governance, respect for ethics, etc.

2. Business acculturation: Here, the focus is more on the end-users within the businesses. The aim is to promote the adoption of the tools and the use of their results before reaching a level of maturity such that the professions become « AI-driven » and reconfigure themselves around the possibilities offered by this new tool.

3. Technological acculturation: This concerns more specifically the people who will be in charge of the development, operation and maintenance of AI with subjects such as the customisation of models, supervision of models in production, standardisation of machine learning, drift management, adaptive online learning, AI-Ops, etc.

[9] IDC Survey Finds Artificial Intelligence Adoption Being Driven by Improved Customer Experience, Greater Employee Efficiency, and Accelerated Innovation

Generally speaking, acculturation is the cornerstone of trust. The designers and users of AI must never be left in the dark when faced with the fundamental questions that AI raises and that they ask themselves.

Equity: Are you alert to possible biases in the AI you use? Are you careful not to introduce bias into your models and the data on which they are based?

Interpretability: Can you explain the results provided by AI, for example its predictions of consumer trends? Do you have the means to corroborate these predictions? Is it possible to explain what happens between the first and the last layer of a neural network?

Robustness and security: How much confidence can you place in the results of your models? Are your models vulnerable to attack?

Governance: Who is responsible for AI applications? Have appropriate controls been put in place?

Compliance: Do your models comply with regulations?

Acceptability: What impact will the use of AI in general and each model in particular have on employees? On customers?

“ As **Aymen Chakhari**, Global Head of AI at Devoteam Group summarises: *« Acculturation builds the necessary trust in AI to make it clear that the outlook is not one of replacement, but one of cooperation. At the end of the day, what everyone must remember is that the addition of an AI and a retail professional is more effective than either that person alone or the AI alone »*

“ *« Acculturation is one of the keys to a successful digital transformation through data and AI. In the retail sector, the size of the turnover is a stumbling block, but it should not be a deal-breaker. All businesses are data consumers and acculturation is key to decompartmentalising the organisation in order to set up a unified data ecosystem ready for AI »* concludes **Laurent Chata**, partner at Devoteam Management Consulting.

CONCLUSION

In retail, as in all sectors of business, AI represents both a huge opportunity and a huge change. The pressing question, therefore, is where to start to put the enterprise on the path to transformation and to receive the benefits as soon as possible.

However, a revolution as profound and lasting as AI cannot be improvised or done in haste. This is why Devoteam recommends starting by setting up four founding pillars that will enable the AI approach to be standardised and the most high-impact projects to be rapidly scaled u

1. Make AI a strategic priority: In order to avoid fragmentation and wasting valuable time and resources, the first step is to put a comprehensive AI strategy in place that is aligned with the company's overall objectives and that incorporates all the aspects mentioned in the previous paragraphs. Particular emphasis should be placed on the acculturation of the different populations concerned, the establishment of appropriate governance and organisation, and the definition and efficient coordination of three key strategies: the data acquisition strategy, the model labelling strategy and the model supervision strategy.

2. Build a solid data foundation: Again, there can be no AI without high-quality data. It is therefore imperative to put in place a global and coherent data strategy that organises, governs and protects all of the company's data, especially its critical data. In this context, an approach based on continuous and parallel improvement of business processes and the data they generate should also be developed. Finally, from a technical point of view, a « data foundation « should be set up in line with this data strategy. It should be capable of feeding into AI models in order to provide end users with the required quality of service.

3. Organise skills: Although tools such as AutoML are helping to democratise AI, different levels of skills are still needed to make the most of its potential. The setting up of a shared Centre of Excellence bringing together expert AI Data Scientists, the training of a few advanced users (AI Citizen Scientists) within businesses and the teaching of the basics of AI to end users (AI Citizen Users) make it possible to optimise the distribution of knowledge and resources. Provide tools for, and organise, good collaboration between these three groups, enabling rapid progress to be made on projects that are balanced between technical and business aspects.

4. Link business processes to AI data and methodologies: This issue is implicit in the previous three points, but it is fundamental. In order to be able to standardise projects and move beyond the restricted framework of Proof of Concepts (PoCs) and Proof of Values (PoVs), it is imperative that AI be based as closely as possible on business processes. Everyone should become involved in the « AI-driven business » by paying attention to AI data, results and good practices.

Finally, this approach must be taken to the highest level of the company by a committed sponsor who is convinced that the future of the retail sector lies in AI. This sponsor must tirelessly bring and defend the message that it is today, through founding projects, that tomorrow's business successes - or failures - will be decided.

ABOUT THE AUTHORS

Benoît Fremaux
VP Retail & CPG
Devoteam
benoit.fremaux@devoteam.com

Benoit Fremaux began his career in the Defence & Security Division of the Sagem Group, where he participated for 11 years in the development of on-board aeronautical systems and police biometric systems, in various positions of responsibility. He then began a journey in Retail spanning more than 18 years, working for companies such as Auchan, Monoprix and Fnac in management positions in IT Services, Operations and Digital. Between 2016 and 2019, he held the position of Information Systems Director at Auchan Retail, before joining the Devoteam group in September 2019.

Aymen Chakhari
Group Global Head of AI & Big Data Director
Founder of the Data Intelligence Academy
Devoteam
aymen.chakhari@devoteam.com

Double graduate of SUP'COM and Télécoms ParisTech (IT engineer), and holder of a PhD in Artificial Intelligence from MIT (2011), Aymen Chakhari leads several big data and machine learning projects involving the design, development and deployment of advanced algorithms within PayPal. He is therefore improving the experience of more than 150 million users. He was also a contributor to the Inria framework, Scikit Learn, before joining Intel as Chief Data Scientist.

Aymen Chakhari brings his expertise in machine learning, with a specialisation in deep learning and reinforcement learning, as well as solid experience in managing large international projects based on artificial intelligence, data science and analytics.

He is now responsible for developing Devoteam's expertise in Artificial Intelligence and Machine Learning. His main task is to standardise AI in order to integrate it into all Devoteam customers' activities, ensuring the sustainable deployment and continuous improvement of algorithms.

In parallel with these duties, Aymen is developing his EDEN-ASH start-up aimed at assisting medical diagnosis, such as with the ASH- BRAIN project, which uses AI to detect neurodegenerative diseases (Parkinson's, Alzheimer's, etc.) at an early stage.

Aymen is also a medical student, which allows him to combine his skills in AI and medicine, and to always act according to Devoteam's #techforpeople values.

Recently, Aymen acquired a new exec MBA degree from MIT Sloan Management and in collaboration with MIT CSAIL on the business and strategic implications of AI.

With contributions by **Elise Darson**,
Marketing Manager France
Devoteam
Contact: elise.darson@devoteam.com

ABOUT DEVOTEAM

Devoteam is a leading consulting firm focused on digital strategy, tech platforms and cybersecurity. By combining creativity, tech and data insights, we empower our customers to transform their business and unlock the future.

With 25 years' experience and 8,000 employees across Europe and the Middle East, Devoteam promotes responsible tech for people and works to create better change.

Creative Tech for Better Change

Contact:

Marketing team
communication@devoteam.com

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